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ABSTRACT

A study examined the nature and frequency of faults and errors in reference list entries selected from 10 journals (principally in the fields of psychology and education). The elements used for data tallying and analysis were: surname, initial(s), and other identifiers, such as Jr. and III; article title; and journal name, volume, issue number, year, and page numbers. All departures from the original (additions, omissions, or changes) were noted. From a total of 10,149 entries, 40.3% were incorrect. These deviations could range from a fault which would not hinder retrieval, to an error which complicated or prevented retrieval. Errors and faults included: (1) omission of the author's middle initial; (2) punctuation faults; (3) misspelling of author surnames; (4) erroneous volume and page numbers; and (5) word changes, additions, replacements, and/or omissions in the title. The results indicate that faults and errors in scholarly writing occur in rather high frequencies. While many of these errors do not actually prevent recovery of the article, they could influence a reader not to seek out the original. No matter how the errors occur, responsibility rests with the writer(s), who should exercise more care in the preparation of reference list entries, as these writers are the models for writers-to-be. (One table of data is included and 26 references are attached.) (PRA)

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A TEN-JOURNAL STUDY OF REFERENCE LIST INACCURACIES

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Abstract

Several writers have documented the kinds and frequencies of faults and errors in reference list entries that accompany scholarly journal articles, principally in the medical literature. The study reported here extended the data to selected psychology and education journals.

Errors rates were similar to those reported for the medical literature. From a total of 10,149 verified references, 4,095 had one or more faults or errors, about 5% of which would hinder recovery. Replacement, omission and/or addition errors in article titles, while not hindering recovery, very well might influence a reader not to seek out the original at all.

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Footnotes, as old as scholarly writing, are perhaps first and foremost an index to a claim of property rights (Price, 1963). As sources for current research, they are also links with the past as well as guides to the future. Present formally in scholarly writing for over 100 years (Price, 1963), they are a necessity without a completely documented history (Freimer & Perry, 1986), differentially practiced, and taught perhaps as much by example as formally (Kaplan, 1965). Perhaps most of all, they are taken for granted, their accuracy and completeness assumed. Whatever other roles the footnote may have, it is the means of preserving continuity of facts and ideas. Thus, verifying references, being accurate in attributions and retrieval specificity, while seemingly self-evident, requires particular attention (Bracey, 1986; Place, 1916; Roland, 1976).

Background

From time to time writers have commented about various errors and difficulties associated with referencing that have occurred, among them Baron (1985), Battaglia (1983), Blanchard (1974), Broadus (1983;), Duce (1975), Gordon (1983), Schmidt (1983); and relative to data bases, Bourne (1977), Edmonds and Harris (1977), Gould (1981), Roughton (1980), Swartz (1979), and Thompson (1978). Some recent examples of difficulties in articles and books were cited by Guglielimi and Roberts (1984),

Garfield (1986), and Grisso (1986). From a study of 24 manuscripts, Grow (1985) illustrated the sorts of errors that occur, some of which can pose difficulty in efforts at retrieval. Ease of retrieval is important if a writer is to follow admonitions and directives that original sources be seen to be cited (Kaplan, 1965; Place, 1916; Roland, 1976).

Finding the original reference from a citation should be a direct process. But an error in the citation can create difficulty. Whereas a wrong ending page number creates no retrieval difficulty, volume and year disagreement, when the wrong one is selected for initial search, is a time consuming nuisance; a wrong journal name causes a major problem. When multiple errors are made in a citation, retrieval usually is severely complicated (Friedman, 1980; Tagliacozzo, Rosenberg, & Kochen, 1970), and sometimes impossible. Doubt about the credibility of the piece containing such an error may arise.

Some analyses of reference list entries have been made, most frequently of the medical journal literature (de Lacey, Record & Wade, 1985; Goodrich & Roland, 1977; Hartmann, 1984; Key & Roland, 1977; Poyer, 1979). Studies of journals in other fields have been made by Boyce and Banning (1979), and A. White (1987). Findings from these studies suggest that, far from being an occasional transgression, faults and errors in reference list entries are a common occurrence. The study reported here extends the data pool by adding information gathered from

articles, which is to say, the authors of those articles, appearing in six previously unstudied journals. Journal selection was quite arbitrary, based on likelihoods of finding source books and journals in the author's home university library. Findings are in no way a reflection on the particular journals selected. At the risk of seeming to declare a conclusion prior to presentation of findings, prior research suggests any other selection of journals apparently would have had a high likelihood of similar results.

Method

Hartmann's (1984) procedures were the basic guidelines for data collection, and conformed closely to the field identifications made many years earlier by Place (1916). For data tallying and analysis, reference list entry elements used were: surname, initial or initials for given name or names, and all other identifiers, such as Jr., III, etc., for all authors; article title; journal name, volume, and issue number when issues were individually paged, year, and page number or numbers, including non-continuous pages (as when intervening material separated article content). The third edition of the American Psychological Association (1983) publication manual was used as the reference for content of all citations. Form differences were ignored.

All misspellings, wrong or omitted initials, omissions of diacritical marks, or any other deviations in the name field, were counted. Additions or omissions of entire names or transposed

names were noted. Reversals of initials were counted as two errors, since both were wrong as cited.

Title field data were accumulated in a similar manner. Each word added, omitted, changed, or replaced with a different word was counted as an error. Punctuation deviations of any kind were tallied. Here also each event was counted, so that multiple errors could occur in a single title. Omissions of sub-titles, omission of the major part of a compound title, or listing a totally wrong title were noted.

All wrong journal names were noted, as were journal name deviations. Year, volume number, and issue number errors were counted, as were pagination errors—beginning, ending, and both wrong, inclusive pages errors, and omission of data in any of these categories.

Pilot study experience (White, 1986a, 1986b) led to the decision to delimit accumulation of data to references to articles in journals. Errors in citations of books appear to be no different than for articles (White, 1986a), and the amount of work involved in finding and verifying citations in journal articles is much less than for an equal number of books. No attempt was made to verify references to computer programs, laws, court decisions, government documents, newspaper articles, papers presented at professional meetings, proceedings from professional symposia, and works not in English. Also for manageability, data collection was further delimited to journals present in the

author's home university library. For the reference list entries to articles in journals as indicated, an effort was made first to verify the reference directly by comparison with the original. If the item was not found, standard reference retrieval and verification tools were used to seek the source of the original article. As a last effort to locate some recent articles, electronic data base searches were made. A photocopy of each reference list entry was compared to the original source, or reference tool entry when necessary. All deviations were recorded by field for each citation and then tallied by source article reference list.

The six journals, and 11 volumes, from which article lists were used were: the Vocational Guidance Quarterly, 33 & 34, the Journal of Vocational Behavior, 27 & 28, the Journal of Occupational Behaviour, 5 & 6, the Journal of Occupational Psychology, 57 & 58, Work and Occupations, 11 & 12, and the American Psychologist, 40. Data from these sources then were added to journal article citations data previously collected (White, 1986a, 1986b) to form a single pool. Articles sampled in the previous research came from volume 24 of Counselor Education and Supervision, volume 31 of the Journal of Counseling Psychology, seven volumes, one in the mid-1980s and two in the middle of the 1970s, 1960s, and 1950s of the Journal of the American Society for Information Science and its predecessor (due to fewer articles with generally fewer references in each volume), and lastly, from the Journal of Counseling and Development and

its predecessors, six volumes, one each in the mid-1980s, 1970s, 1960s, and 1950s, and two in the mid-1940s (journal references being much less frequent in that decade).

Results

From a total of 10,149 verified reference list entries, 4,095 were incorrect—40.3%. If this sample is at all representative, the likelihood of any one reference having a fault or error is about 4 in 10. The deviation from the original source could range from a fault not hindering retrieval to an error complicating or (in rare instances) preventing retrieval. Percentages over journals varied, and very well may be an artifact of sampling. The basic sampling unit is the article—that is to say, the article's author or authors. The sample used here consisted of 999 articles, reports, letters, and comments which had one or more verified citations. Of this total, 178 (17.8%) had one or more verified references with no fault or error. The number and size of articles over journals varied widely, as did the numbers of references verified per article. Inconsistent results from comparisons over journals in previous analyses suggest that large samples of author sources probably are required, and when gathered, tend to minimize differences between journal sources of article-author fault/error data.

Aggregate fault/error data are reported in Table 1. First author surname often is used either for retrieval or for citation searches. In the current data, 143 errors were found, for a

percentage of all references of 1.41%. This figure is similar to the result 1.5% found by Poyer (1979).

Goodrich and Roland (1977) and Key and Roland (1977) reported incorrect title data that appear to afford a direct comparison with current data. They counted any deviation from the original, resulting in 15.6% and 26.4% rates, respectively. The percentage in the current study was 20.5% .

Insert Table 1 about Here

Year of publication usually is important for retrieval. In the Goodrich and Roland (1977), Hartmann (1984), Key and Roland (1977) and Poyer (1979) studies, year error rates ranged between 0.4% and 2.0%. The rate here was 0.93%. If this result is a good estimate of typical experience, then almost one out of 100 times a reference is sought the year indicated in the source will be in error. Data here also suggest that using year is roughly 2.8 times safer than using volume number. Why volume number errors should be made so much more frequently is not readily explained, except for the difficulties some people may have in translating the occasional Roman numbers to Arabic values, the fact that some journals have more than one volume per year, and that some journals do not have their publication year congruent with the calendar year.

Including the issue number and getting it correct is a difficulty apparently similar to getting the volume number correct. Of all faults and errors, 2.76% were errors of issue number omission or having the number wrong. If all journals would have continuously paged volumes, this source of writer error could be eliminated. Even pages numbers were a source of error; 7.89% of all errors were in this category.

A marked source of error was omission of author middle initial. This error was made in 969 (9.54%) of all first author names, and in 715 additional author instances, making this one error the most frequent overall—16.59% of all faults and errors.

Illustrative Examples

The title of an article is not necessary for retrieval (Poyer, 1979). However, major words in a title become keys in topical searches. Inserted, omitted, or replaced words or punctuation changes can alter meaning and affect a searcher's decision about whether to seek the source or pass it by.

Examples were selected from throughout the 10,149 references regardless of source, although most of those presented here are from sources added to the data pool after the two initial projects (White, 1986a, 1986b) were completed. In no way were the selections intended to reflect on any author or journal. Selections displayed are only a few of those found, though they may be among the more lurid.

Perhaps word replacements occur when handwriting is misread. In the following pairings, the first word shown was in the original but was replaced by the second word: causes, uses; tool, goal; social, special; employer, employee; induced, included; young, your; faculties, facilities. Other replacements are less easily attributed to misreading, such as: scales, success; patterns, problems; variables, constraints; influences, factors; arousal, behavioral; into action, about others; with children, in the schools; race, role; psychological, physiological; congruence, consequence; or, counseling psychology, counseling research. Larger discrepancy substitutions include: big, small; population, sample; health, individual well-being; illness, disease; psychologist, physician; typological, typographical.

Words omitted from an article title also may influence reader's decision about retrieval, especially if the article is cited with little or no explicit specification of content. (That fact alone may discourage retrieval, of course.) The omission of the underlined word or words, in the following sets, are some of those found: social climate[s] indices; rural economic development; nonrecursive models of labor force participation; employee work motivation; the distribution . . . , 1958-1977; perceived task characteristics and job satisfaction; test for military pilots.

Entire titles are sometimes virtually substituted through replacements of words, omissions, additions and/or

rearrangements. For example, a title that should have read "Education, occupation, and wage differences between white and black men" appeared thusly: "Black/white differences in occupation, education, and wages." A brief original title which read "Sex differences in college major" was cited this way: "Sex differences in education: an analysis of the determinants of college major." The omission of a sub-title sometimes leaves the reader with little basis for judging the actual article content. For example, a title cited simply as "Small wins" should have read "Small wins: Redefining the scale of social problems."

The omission or insertion of quote marks can have an important influence on meaning. Quotes omitted from the word counselors in a title that should read (in part) "Perceptions of 'counselors' and other help givers" is likely to give a different impression than the author's intent. A lesser wrong impression may result when quotes are omitted from "On disposing of 'straw people'."

After the novelty of comparing reference list entries to original sources wore off (in recollection, somewhere around the 4,538th comparison—though no record was made), the most bothersome errors were those involving a wrong journal name. Next were combinations of year and volume number errors, followed by wrong beginning page numbers — in brief, anything that required a search for the information necessary to find the original article. If a journal has an index, or an easily scanned

volume table of contents, a wrong beginning page number is rather easily rectified. Having to scan several issues individually is a bigger bother.

Early in the data collection process, volume number was used in preference to year, but with experience and a preliminary data summary, year proved to be the less likely of the two entry elements to be in error. When both were wrong, then resorting to a bibliographical tool usually was the most efficient alternative. The same detour was required when the journal name was wrong. Of all errors, these were the most time expensive and patience trying.

For example, when the journal name should have been the Journal of Experimental Social Psychology or the Journal of Applied Social Psychology but the word Social was omitted, retrieval was immensely complicated. Here are some other examples: Psychological Review should have been Psychological Bulletin; American Psycholgist really was American Sociologist; Journal of Human Relations should have been Journal of Human Stress; and when a complete change of journal name was made, from Elementary School Guidance and Counseling to the School Counselor.

Name changes also can be vexatious, as when Armistead, N(igel), becomes Nigel, A.; or Eells is changed to Ellis; or Abrams to Adams. An even more complicating situation is when two or more errors occur in the same entry, as when the American

Journal of Orthopsychiatry, 55, erroneously becomes the American Journal of Psychiatry, 138. Multiple errors in the elements critical to retrieval are especially onorous, but the articles that are unfound after one has conducted a major search leave the most dissatisfaction.

Discussion

Apparently reference lists in scholarly journals in addition to the medical literature contain faults and errors in rather high frequencies. The majority of the inaccuracies are perhaps best regarded as faults, since they do not escalate retrieval efforts. Nevertheless, a situation is exposed that should not exist.

How do the faults and errors occur? No doubt some errors do occur in the various re-keyings required in many journal publication procedures. Epstein (1985) declared that he has modified reprints to correct errors that occurred after the galley or page proof reading stage. With wider use of microcomputer word processing and telecommunications technology, some of the re-keying steps may be eliminated. When this consolidation occurs, the actual main source of the difficulty, in all likelihood, will be exposed. The individual author, or author group, almost surely is the origin of most of the discrepancies. One basis for this argument is the large number of word changes in titles of articles as cited in references. Some of the changes, as illustrated above, may be "typos," but many, probably most, are more likely attributable directly to the writer—presumed also to be the

original note taker. Kolata (1987) discussed an instance of some notoriety about an alleged "typo" around which some doubt was expressed.

The large number of omissions of initials of given middle names suggests that these data never were recorded, rather than omitted by a typist (and not corrected by the writer). Whether these and other findings have any relationship to accuracy in the body of the article is not known. Do reference lists get short shrift? Are they that much of an appendage? If over "99.9999 percent of reports are accurate and truthful," as Koshland (1987a, p. 141) was inclined to believe, then inaccuracy at least in reference lists obviously occurs in the context of overall truthfulness. In a reply to Koshland's editorial, R. R. White (1987) suggested a much higher estimate of errors was more realistic. Koshland (1987b) reiterated his previous view but acknowledged that "poor citations are probably the most prevalent of the ills listed, but the most important error in that regard is usually lack of scholarship" (p. 1447). The findings reported here and previously are not inconsistent with that view.

Responsibility for accuracy of reference list entries rests with the writer(s) as is clearly stated in the Publication Manual of the American Psychological Association. Some journals so indicate in the instructions to authors ("Guidelines for Authors," 1987; "Instructions to Authors," 1987), but some do not. Obviously, much more writer care is required to meet these guidelines.

At the very least, reference list entries pose a problem for researchers who prefer to document intervening references as evidence of an 'information trace.' Cooper (1985) observed that the strategy most frequently used by review writers in gathering material is examination of references in previous reviews.

Reference list entries are facts, just as are assertions, arguments, quotes, statements of procedures, findings, and conclusions in the main body of an article. Is the pressure to publish a cause of high rates of error? Is instruction in scholarly writing faulty? Are the data discovered in this study in any way related to reports of falsified data in research work? Is the problem one of ethics more than lack of technical competence or training?

Clearly, taking a reference list entry as accurate is quite unsafe. Clearly, writers should exercise considerably more care in the preparation of reference list entries, if not more care generally. Clearly, only some of the errors can be explained as "typos." Even these are almost completely avoidable. However errors occur, responsibility rests with the author(s).

Everyone who writes for the archives of a discipline should live up to the highest standards of scholarly writing. Since journal editors are at the mercy of writers, the problem is one that must be recognized and then solved by writers themselves who also are, for good or ill, the major models for the writers-to-be.

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Table 1

Summary of faults and errors in reference list entries from a sample of articles in 26 volumes of 10 journals.

Reference element	First Author	Other Authors	Total
Author(s)			
Surname wrong or misspelled	143	124	267
First initial wrong or omitted	90	59	149
Second initial wrong, omitted or added	969	715	1684
Other: punct., author omit, add wrong order			363
Article Title			
Words add, omit, replace, change			1180
Punctuation			663
Other: sub-title omit, add; wrong title major title omit, other faults			239
Bibliographic Entry Elements			
Journal name wrong or faulty			93
Year wrong or omitted			94
Volume (date) wrong or omitted			265
Issue number omitted or wrong			280
Pages: one or both wrong or omitted inclusive pages error, other fault			801
Other faults or errors			12